

CLAIMS

What is claimed is:

1. A transmitter having programmable transmission parameters temporally aligned with a payload signal,
10 said transmitter comprising:
 - an upstream module for receiving an input signal from a signal source, generating a processed signal from said input signal, and mingling said programmable transmission parameters with said processed signal to
15 form a compound signal;
 - an intra-transmitter signal transporter having an input coupled to said upstream module and configured to transport said compound signal to an output of said intra-transmitter signal transporter; and
 - 20 a downstream module having an input coupled to said intra-transmitter signal transporter output, said downstream module being configured to extract said programmable transmission parameters from said compound signal to recover said processed signal and to convert
25 said processed signal into a communication signal configured in accordance with said programmable transmission parameters.
-
2. A transmitter as claimed in claim 1 wherein:
 - 30 said upstream module is one of a plurality of upstream modules each of which couples to said intra-transmitter signal transporter;
 - 35 said downstream module is one of a plurality of downstream modules each of which couples to said intra-transmitter signal transporter; and
 - said compound signal is one of a plurality of compound signals transported by said intra-transmitter signal transporter.

5

3. A transmitter as claimed in claim 2 wherein
said intra-transmitter signal transporter is a bus
operated in accordance with a bus protocol that causes
said compound signals to be transported thereon after
10 experiencing varying delays.

4. A transmitter as claimed in claim 1 wherein
said downstream module generates said communication
signal by modulating a carrier signal, said carrier
15 signal exhibiting a frequency specified by said
programmable transmission parameters.

5. A transmitter as claimed in claim 1 wherein
said downstream module generates said communication
20 signal by modulating a carrier signal which is keyed as
specified by said programmable transmission parameters.

6. A transmitter as claimed in claim 1 wherein:
said input signal is a digital data stream;
25 said upstream module is a digital communication
modulator which modulates said input signal in
accordance with a phase constellation to produce said
processed signal in a digital form; and
said downstream module includes a digital-to-analog
30 converter for converting said processed signal so that
said communication signal exhibits an analog form.

5 7. A transmitter as claimed in claim 6 wherein:
said digital communication modulator applies first
modulation functions at a first point in time on said
input signal to generate said processed signal, said
first modulation functions being defined by a first set
10 of programming;

 said digital communication modulator additionally
applies second modulation functions at a second point
in time on said input signal to generate said processed
signal, said second modulation functions being defined
15 by a second set of programming; and

 a transport delay imposed by said digital
communication modulator in generating said processed
signal from said input signal under said first set of
programming differs from a transport delay imposed in
20 generating said processed signal from said input signal
under said second set of programming.

5 8. A transmitter as claimed in claim 1 wherein:
said upstream module comprises a connector through
25 which said compound signal passes to said intra-
transmitter signal transporter;

 said downstream module comprises a connector
through which said compound signal passes from said
intra-transmitter signal transporter; and

30 said downstream module is replaceable independently
from said upstream module.

5 9. A transmitter as claimed in claim 1 wherein:
said downstream module converts said processed
signal into said communication signal in response to a
clock signal; and

10 said transmitter additionally comprises a first-in-
first-out memory buffer configured to synchronize said
compound signal to said clock signal.

10. A transmitter as claimed in claim 1 wherein:
said downstream module upconverts said processed
15 signal so that said communication signal is a radio
frequency (RF) signal; and

20 said downstream module comprises an RF power
amplifier coupled to an antenna, said RF power
amplifier and said antenna being configured to
wirelessly broadcast said communication signal.

5 11. In a communication system in which a transmitter transmits a communication signal to one or more receivers in accordance with one or more communication protocols, a method of forming said communication signal in response to programmable
10 transmitter parameters that are temporally aligned with payload information, said method comprising:

generating a processed signal from an input signal which conveys said payload information;

15 mingling said programmable transmission parameters with said processed signal to form a compound signal;

transporting said compound signal from an upstream module to a downstream module;

20 extracting said programmable transmission parameters from said compound signal in said downstream module to recover said processed signal; and

25 converting said recovered processed signal into said communication signal, said communication signal being configured in accordance with said programmable transmission parameters.

12. A method as claimed in claim 11 wherein said transporting activity causes said compound signal to experience varying amounts of delay.

30 13. A method as claimed in claim 11 additionally comprising, prior to said extracting activity, delaying said compound signal in a first-in-first-out (FIFO) memory buffer which imposes varying delays on said compound signal.

5 14. A method as claimed in claim 11 wherein said
converting activity comprises modulating a carrier
signal, said carrier signal exhibiting a frequency
specified by said programmable transmission parameters.

10 15. A method as claimed in claim 11 wherein said
converting activity comprises modulating a carrier
signal which is keyed as specified by said programmable
transmission parameters.

15 16. A method as claimed in claim 11 wherein:
 said input signal is a digital data stream;
 said generating activity is performed by a digital
communication modulator which modulates said input
signal in accordance with a phase constellation to
20 produce said processed signal in a digital form; and
 said converting activity comprises converting said
recovered processed signal so that said communication
signal exhibits an analog form.

25 17. A method as claimed in claim 16 wherein:
 said digital communication modulator is programmed
to apply first modulation functions to said digital
data stream and impose a first transport delay on said
digital data stream; and
30 said method additionally comprises reprogramming
said digital communication modulator to apply second
modulation functions to said digital data stream and
impose a second transport delay on said digital data
stream, said second transport delay differing from said
35 first transport delay.

5 18. A transmitter as claimed in claim 11 wherein
said converting activity upconverts said recovered
processed signal so that said communication signal is a
radio frequency (RF) signal which is wirelessly
broadcast to said one or more receivers.

10

00000000000000000000000000000000

- 5 19. A radio frequency (RF) transmitter for use in
a communication system in which said RF transmitter
transmits first and second communication signals to one
or more receivers in accordance with one or more
communication protocols, said transmitter comprising:
- 10 a first software-programmable upstream module
programmed to apply first digital communication
modulation functions to a first input signal and to
generate a first processed signal which exhibits a
first transport delay relative to said first input
15 signal, said first upstream module having a first
upstream connector and being configured to mingle first
programmable transmission parameters with said first
processed signal to form a first compound signal which
passes through said first upstream connector; and
- 20 a second software-programmable upstream module
programmed to apply second digital communication
modulation functions to a second input signal and to
generate a second processed signal which exhibits a
second transport delay relative to said second input
25 signal, said second upstream module having a second
upstream connector and being configured to mingle
second programmable transmission parameters with said
second processed signal to form a second compound
signal which passes through said second upstream
30 connector.

5 20. An RF transmitter as claimed in claim 19
further comprising:

10 an intra-transmitter signal transporter having a
first input coupled to said first connector and a
second input coupled to said second connector, said
intra-transmitter signal transporter being configured
to respectively transport said first and second
compound signals to first and second outputs of said
intra-transmitter signal transporter, said first and
second compound signals being transported with varying
15 amounts of delay;

20 a first downstream module having a first downstream
connector coupled to said first output of said intra-
transmitter signal transporter, said first downstream
module being configured to extract said first
programmable transmission parameters from said first
compound signal to recover said first processed signal
and to convert said first processed signal into said
first communication signal configured in accordance
with said first programmable transmission parameters;
25 and

30 a second downstream module having a second downstream
connector coupled to said second output of
said intra-transmitter signal transporter, said second
downstream module being configured to extract said
second programmable transmission parameters from said
second compound signal to recover said second processed
signal and to convert said second processed signal into
said second communication signal configured in
accordance with said second programmable transmission
35 parameters.

5 21. An RF transmitter as claimed in claim 20
wherein:

10 said first downstream module generates said first communication signal by modulating a first carrier signal, said first carrier signal exhibiting a frequency specified by said first programmable transmission parameters and being keyed as specified by said first programmable transmission parameters; and

15 said second downstream module generates said second communication signal by modulating a second carrier signal, said second carrier signal exhibiting a frequency specified by said second programmable transmission parameters and being keyed as specified by said second programmable transmission parameters.

CONFIDENTIAL - 2025 RELEASE UNDER E.O. 14176